

WHAT IS CLAIMED IS:

1. An SAW sensor device using a slit acoustic wave, comprising:

a piezoelectric medium having a thin membrane at its one portion, a medium at the other portion, and a narrow slit which the slit acoustic wave passes through at its inside;

an input IDT formed at the outer portion in the narrow slit of the piezoelectric medium, for transducing an electric input signal into the slit acoustic wave; and

an output IDT formed at the outer portion opposite to the input IDT, for receiving the propagated slit acoustic wave and transducing the wave into an electric signal, whereby an external pressure transmitted to the device is sensed.

2. The SAW sensor device according to claim 1, wherein a width of the narrow slit is varied according to the pressure transmitted to the thin membrane, and a velocity of the slit acoustic wave propagated in the narrow slit is shifted according to variations of the width of the narrow slit.

3. The SAW sensor device according to claim 1, wherein the velocity of the slit acoustic wave is shifted according to a property of the medium of the piezoelectric medium.

4. An SAW sensor device using a slit acoustic wave, comprising:

a piezoelectric medium having a narrow slit which the slit acoustic wave passes through at its inside, and being divided into an upper portion and a lower portion from the narrow slit, for sensing liquid in the device;

an input IDT formed at one side of the piezoelectric medium, for transducing an electric input signal into the slit acoustic wave;

an output IDT formed at the opposite side to the input IDT in the piezoelectric medium, for receiving the propagated slit acoustic wave, and transducing the wave into an electric signal;

an input liquid port for inputting the liquid into the narrow slit of the piezoelectric medium; and

an output liquid port for outputting the liquid of the narrow slit of the piezoelectric medium.

5. The SAW sensor device according to claim 4, wherein, when the liquid flows in the narrow slit, dielectric permittivity and viscosity of the liquid are sensed by measuring a velocity and frequency of the slit acoustic wave of the liquid of the narrow slit.

6. A method for sensing an external pressure of an SAW sensor device, comprising the steps of:

(a) when a thin membrane does not receive a pressure, calculating a frequency and velocity of electric signals of an input IDT and an output IDT in a narrow slit, and comparing the resultant values;

(b) when the thin membrane receives an external pressure, calculating a frequency and velocity of electric signals of the input IDT and the output IDT, and comparing the resultant values; and

(c) sensing intensity of the external pressure in consideration of velocity and frequency shifts due to the external pressure transmitted to the thin membrane.

7. The method according to claim 6, wherein step (c) for sensing the intensity of the external pressure is performed by previously setting frequency and velocity shift value data under the external pressure to an external device, and comparing the data values.

8. A method for sensing liquid of an SAW sensor device, comprising the steps of:

(a) measuring a phase velocity of a slit acoustic wave proceeding in an empty slit, and calculating a frequency;

(b) when the liquid flows in the narrow slit through an input liquid port, measuring a phase velocity of the slit acoustic wave in the narrow slit, and calculating a frequency; and

(c) sensing dielectric permittivity and viscosity of the liquid passing through the narrow slit in consideration of velocity and frequency shifts.

9. The method according to claim 8, wherein step (b) for measuring the phase velocity of the slit acoustic wave and calculating the frequency calculates the velocity and frequency of the slit acoustic wave when the liquid is filled in an output liquid port.

10. The method according to claim 8, wherein step (c) for sensing the dielectric permittivity and viscosity of the liquid is performed by previously setting dielectric permittivity and viscosity data of all kinds of liquids in an external device, and comparing the data values.